

Appendix table 4-17

Worldwide R&D expense and domestic R&D performance paid for by the company and by others, by business activity: 2008

(Millions of U.S. dollars)

Business activity	Business code ^a	Worldwide R&D expense	Domestic R&D performance		
			Total	Paid for by company	Paid for by others
All business activities	21100-81390	328,040	290,681	232,505	58,176
Oil and gas extraction	21100	1,215	616	609	7
Coal mining	21210	55	D	52	D
Metal ore mining	21220	67	57	57	0
Nonmetallic mineral mining and quarrying	21230	129	126	126	0
Support activities for oil and gas operations	21300	914	D	706	D
Support activities for solid mineral operations	21310	*	*	*	0
Electric power generation, transmission, and distribution	22110	437	424	237	187
Natural gas distribution	22120	19	1	1	0
Water, sewage, and other systems	22130	10	8	7	1
Construction of buildings	23600	377	373	367	6
Heavy and civil engineering construction	23700	40	31	31	0
Specialty trade contractors	23800	1,123	1,072	1,065	7
Food manufacturing	31100	2,983	2,229	2,196	33
Beverage manufacturing	31210	605	*	437	*
Tobacco manufacturing	31220	D	D	D	3
Textile mill products	31300	474	322	318	4
Apparel manufacturing	31500	448	430	424	6
Leather and allied products manufacturing	31600	65	56	56	0
Wood products manufacturing	32100	264	*	216	*
Paper manufacturing	32200	1,130	897	896	1
Printing and related support activities	32300	297	*	291	*
Petroleum and coal products manufacturing	32400	1,082 i	D	949 i	D
Basic chemicals manufacturing	32510	3,806	2,918	2,871	47
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	1,152	911	889	22
Pesticide, fertilizer, and other agricultural chemical manufacturing	32530	2,100	D	1,378	D
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic) manufacturing	32541	70,016	44,390	41,593	2,797
In-vitro diagnostic substances manufacturing	32542	1,988	1,051	982	69
Soap, cleaning compound, and toilet preparations manufacturing	32591	2,787	1,985	1,982	3
Paint, adhesive, and other chemical manufacturing	32592	2,152	1,773	1,750	23
Plastics and rubber products manufacturing	32600	2,536	2,175	2,099	76
Clay and glass products manufacturing	32710	966 i	931 i	903 i	28
Cement, concrete, lime, gypsum, and other nonmetallic mineral product manufacturing	32790	738	546	545	1
Iron and steel mills, ferroalloy, and steel product from purchased steel	33110	331	254	250	4
Nonferrous metals production and processing	33130	415	295	292	3
Ferrous and nonferrous foundries	33150	85	*	83	*
Fabricated metal products manufacturing	33200	2,935	2,617	2,474	143
Farm machinery and equipment manufacturing	33311	1,404	861	859	2
Construction machinery manufacturing	33312	581	498	498	0
Mining machinery and equipment manufacturing	33313	1,689	1,443	1,408	35
Oil and gas field machinery and equipment manufacturing	33314	277	255 i	255 i	0
Semiconductor machinery manufacturing	33321	2,553	2,179	2,152	27
Industrial machinery manufacturing, except semiconductor machinery	33322	1,191	850	831	19
Commercial, service industry, temperature control, and airflow control machinery manufacturing	33330	1,110	881	859	22
Engine, turbine, and power transmission equipment manufacturing	33360	2,386	1,982	1,859	123

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			Total	Paid for by company	Paid for by others
Metalworking and other general purpose machinery manufacturing	33390	2,039	1,460	1,394	66
Computers and peripheral equipment manufacturing	33410	12,443	9,526	9,223	303
Telephone apparatus manufacturing	33421	6,739	5,445	5,424	21
Radio and television broadcasting and wireless communications equipment manufacturing	33422	5,958	5,042	4,184	858
Communication equipment manufacturing, except broadcasting, wireless, and telephone apparatus	33429	2,482	2,360	1,833	527
Audio and video equipment manufacturing	33430	773	D	610	D
Semiconductor and other electronic components manufacturing	33440	29,911	23,154	22,674	480
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	3,822	4,752	2,853	1,899
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	1,845	6,525	1,563	4,962
Measuring and control instruments manufacturing (not listed elsewhere)	33459	3,458	2,714	2,614	100
Manufacturing and reproducing magnetic and optical media manufacturing	33460	54	D	53	D
Electrical equipment, appliances, and components manufacturing	33500	4,687	3,128	2,978	150
Motor vehicles manufacturing	33610	18,296	8,970	8,305	665
Motor vehicle body and trailer manufacturing	33620	70	63	62	1
Motor vehicle parts manufacturing	33630	5,401	3,538	3,378	160
Aircraft manufacturing	33641	4,053	9,796	3,915	5,881
Aircraft engine and engine parts manufacturing	33642	2,433	3,530	1,612	1,918
Other aircraft parts and auxiliary equipment manufacturing	33643	1,222	1,705	942	763
Guided missiles, space vehicles, and parts manufacturing	33644	1,402	6,035	1,310	4,725
Railroad rolling stock manufacturing	33651	195	D	146	D
Ship and boat building	33660	151	D	139	D
Motorcycle, bicycle, and parts manufacturing	33691	199	173	173	0
Military armored vehicle, tank, and tank components manufacturing	33692	107	367	111	256
All other transportation equipment manufacturing	33699	176	211	148	63
Furniture and related products manufacturing	33700	511	*	435	*
Medical equipment and supplies manufacturing	33910	11,587	8,690	8,521	169
Miscellaneous manufacturing (not listed elsewhere)	33990	2,976	2,555	2,316	239
Merchant wholesalers, durable goods	42300	449	422	393	29
Merchant wholesalers, nondurable goods	42400	257	175	174	1
Wholesale electronic markets and agents and brokers	42500	14	25	12	13
Motor vehicle and parts dealers	44100	0	1	1	0
Electronics and appliance stores	44300	*	*	*	0
Food and beverage stores	44500	2	3	2	1
Clothing and clothing accessories stores	44800	1	8	8	0
General merchandise stores	45200	34	13	13	0
Electronic shopping and mail-order houses	45410	480	D	D	0
Nonstore retailers, except electronic shopping and mail-order houses	45490	12	1	1	0
Retail trade stores, including gasoline stations (not listed elsewhere)	45990	343	*	336	*
Air transportation	48100	D	D	D	0
Rail transportation	48200	37	*	37	*
Water transportation	48300	5	5	5	0
Truck transportation	48400	20	18	18	0
Transit and ground passenger transportation	48500	1	1	1	0

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			Total	Paid for by company	Paid for by others
Pipeline transportation of crude oil, refined petroleum, and miscellaneous products, except natural gas	48610	0	0	0	0
Pipeline transportation of natural gas	48620	3	0	0	0
Scenic and sightseeing transportation	48700	0	0	0	0
Support activities for transportation	48800	36	36	30	6
Couriers and messengers	49200	D	D	D	0
Warehousing and storage	49300	26	*	30	*
Newspaper, periodical, book, and directory publishers (except Internet)	51110	180	156	156	0
Software publishers (except Internet)	51120	31,369	24,227	23,860	367
Motion picture and sound recording (except Internet)	51200	104	94	94	0
Radio and television broadcasting (except Internet)	51510	48	32	32	0
Cable and other subscription programming (except Internet)	51520	D	D	D	0
Internet publishing and broadcasting	51600	188	*	179	*
Wired telecommunications carriers	51710	673	511	511	0
Wireless telecommunications carriers (except satellite)	51720	532 i	295	294	1
Satellite telecommunications	51740	153	D	121	D
Cable and other program distribution	51750	367	295	286	9
Telecommunications services (not listed elsewhere)	51790	501	452	393	59
Internet service providers and Web search portals	51810	4,558	3,725 i	3,718 i	7
Data processing, hosting, and related services	51820	3,515	3,048	3,004	44
Information services (not listed elsewhere)	51900	898	D	815	D
Depository credit intermediation	52210	284 i	282 i	282 i	0
Nondepository credit intermediation	52220	3	2	2	0
Activities related to credit intermediation	52230	430	376	376	0
Securities, commodity contracts, and other financial investments and related activities	52300	389	340	339	1
Insurance carriers	52410	199	145	145	0
Agencies, brokerages, and other insurance-related activities	52420	125 i	125 i	118 i	7
Funds, trusts, and other financial vehicles	52500	101	101	101	0
Real estate	53100	20	19	19	0
Automotive equipment rental and leasing	53210	D	D	D	0
Consumer goods and general rental centers	53220	296	131	131	0
Commercial and industrial machinery and equipment rental and leasing	53240	101	43	43	0
Lessors of nonfinancial intangible assets	53300	80	76	76	0
Legal services	54110	D	D	D	0
Accounting, tax preparation, bookkeeping, and payroll services	54120	676	577	577	0
Architectural, engineering, and related services	54130	1,742	6,923	1,365	5,558
Specialized design services	54140	75	628	58	570
Computer systems design and related services	54150	11,476	11,469	8,384	3,085
Management, scientific, and technical consulting services	54160	1,110	1,637	884	753
Scientific research and development services	54170	12,656	16,557	8,464	8,093
Advertising and related services	54180	37	*	60	*
Professional, scientific, and technical services (not listed elsewhere)	54190	439	1,196	374	822
Management of companies and enterprises	55100	11	*	11	*
Business support services	56140	125	*	83	*
Travel arrangement and reservation services	56150	27	19	19	0
Investigation, security, and services to buildings and dwellings	56160	137	62	61	1
Office administrative, facilities, employment, and other support services	56190	1,139	1,217	1,126	91
Waste collection, treatment, and disposal	56210	7	7	7	0
Remediation and other waste management services	56290	*	*	*	0
Educational services	61100	202	193	185	8

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			Total	Paid for by company	Paid for by others
Offices of physicians	62110	40	51	30	21
Offices of dentists and other health practitioners	62120	202	201	201	0
Medical and diagnostic laboratories	62150	903	1,072	781	291
Home health care services	62160	3	3	3	0
Outpatient care centers and other ambulatory health care services	62190	53	12	7	5
General medical and surgical hospitals	62210	13	35	12	23
Psychiatric, substance abuse, and specialty hospitals	62220	0	0	0	0
Nursing and residential care facilities	62300	15	10	10	0
Social assistance (except child day care services)	62400	8	6	6	0
Child day care services	62440	1	1	1	0
Performing arts, spectator sports, and related industries	71100	24	24	24	0
Amusement, gambling, and recreation industries	71300	138	D	78	D
Traveler accommodation services	72100	0	0	0	0
Food services and drinking places	72200	481	480	480	0
Automotive repair and maintenance	81110	307	269	269	0
Repair and maintenance, except automotive	81190	99	55	55	0
Personal care, death care, laundry, and other personal services	81200	37	30	30	0
Business, professional, labor, political, and similar organizations	81390	1	0	0	0
Undistributed	–	10,660	18,547	9,209	9,338

* = < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System

^aBusiness codes and descriptions based on 2002 NAICS industry definitions.

NOTES: Data tabulated independent of the industry classification of the company. Detail may not add to total because of rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2008.

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